**Steps to build R-pi for Tank controller/serial**  
8gb micro SD (or larger), R-Pi 2 vB (should work with any version)

2017-01-11-raspbian-jessie.img flashed to SD card

sudo apt-get update

sudo apt-get dist-upgrade

sudo raspi-config  
(expand filesystem)  
(advanced ->)  
 (enable SSH)  
 (A8 Serial – disable serial boot console)  
 (hostname – Rpi\_main\_fish)  
enable serial in raspi-config from start menu

edit /boot/cmdline.txt to remove serial console

sudo passwd (set to std password)

sudo apt-get install python-serial  
  
make /app for code storage, set to 777

sudo mkdir app  
sudo chmod 777  
  
restart Pi

confirm serial is active:  
 ls /dev/tty\*  
look for “/dev/ttyAMA0”

---------- configure apache webserver -------------

sudo apt-get install apache2 -y

apache config in:  
/etc/apache2

change port to 81:  
sudo vi /etc/apache2/ports.conf

restart apache:  
sudo /etc/init.d/apache2 restart

find IP:  
hostname -I

browse to {IP}:81 to test

install PHP and module for apache:  
sudo apt-get install libapache2-mod-php5 php5 php5-xcache php5-mysql php5-curl php5-gd

install MySQL:  
sudo apt-get install mysql-server  
(set root password (default))

set timezone:  
sudo cp /usr/share/zoneinfo/US/Central /etc/localtime

restart apache:  
sudo /etc/init.d/apache2 restart

php test content:  
sudo vi /var/www/html/index.php

add the below, save, close  
<?php echo "hello world"; ?>

<?php echo date('Y-m-d H:i:s'); ?>

<?php phpinfo(); ?>

give execute permissions:  
sudo chmod 755 /var/www/html/index.php

test:  
[http://(ip):81/index.php](http://192.168.4.193:81/index.php)

Configure apache to source page content in /app/tank/www/:  
sudo vi /etc/apache2/apache2.conf  
add the following lines below other directory aliases:  
#---------

<Directory /app/tank/www/>

Options Indexes FollowSymLinks

AllowOverride None

Require all granted

</Directory>

Alias "/tank" "/app/tank/www/"

#----------

Add TankController code package:  
copy tarball to Pi then untar with the below command  
 tar -C / -xvf tank03142108\_pub.tar

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configure MySql  
configure python for SQL:

sudo apt-get install python-mysqldb

sudo pip install mysql-connector

create MySql non-root user(sqladmin - change password, and note it down)):  
sudo mysql -u root -p

GRANT ALL PRIVILEGES ON mydb.\* TO 'sqladmin'@'localhost' IDENTIFIED BY 'password';

exit

install PhPMyadmin

sudo apt-get install phpmyadmin

configure apache to use PHPadmin  
sudo vi /etc/apache2/apache2.conf  
add at end (near other includes):  
Include /etc/phpmyadmin/apache.conf

restart apache:  
sudo /etc/init.d/apache2 restart

test PHP admin website:  
http://(IP):81/phpmyadmin/

add MySQL content/Import SQL database

in phpMysqualdmin, login as **root**

go to users, select “edit privileges” for **sqladmin** account, give all privileges.  
log out, and log back in as **sqladmin**

create new database named “tank”  
select “tank” select “import” and import the tank.sql file

move python\_mysql\_dbconfig.py to python dist folder  
sudo cp python\_mysql\_dbconfig.py /usr/lib/python2.7/dist-packages  
sudo chmod 755 /usr/lib/python2.7/dist-packages/python\_mysql\_dbconfig.py

Modify SQL connection info for website:  
edit SQLconn.php to use correct password  
vi /app/tank/www/SQLconn.php

edit SQLconfig.ini to use correct password:  
vi /app/tank/SQLconfig.ini

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Python script as service:  
Copy the init script (/app/tank/monitorserial.sh) into /etc/init.d and set permissions  
sudo cp monitorserial.sh /etc/init.d  
sudo chmod 755 /etc/init.d/monitorserial.sh

add in symbolic links to the /etc/rc?.d directories so that the init script is run at the default times  
sudo update-rc.d monitorserial.sh defaults

sudo systemctl enable monitorserial.sh

Verify links with:  
ls -l /etc/rc?.d/\*monitorserial.sh

At this point you should be able to start your Python script using the command  
 sudo /etc/init.d/monitorserial.sh start  
or  
sudo systemctl start monitorserial

check its status with the  
/etc/init.d/monitorserial.sh status  
or  
systemctl status monitorserial

and stop it with   
sudo /etc/init.d/monitorserial.sh stop  
or  
sudo systemctl stop monitorserial